

GRADE 6

ALGEBRAIC EXPRESSIONS

Complete Worksheet Pack

What this pack covers

Variables • Constants • Coefficients • Terms • Translating words into expressions •
Evaluating expressions • Combining like terms • Real-life algebra • Algebraic
reasoning

6 practice worksheets + 6 separate answer-key pages

Worksheet 1: Variables, Constants & Terms

Show your working. Use correct algebraic notation and check your answer by substituting when useful.

1. In the expression $7x + 5$, identify the variable, coefficient and constant.
2. How many terms are in $3a + 4b - 9$?
3. Identify the coefficient of y in $-6y + 2$.
4. Write an expression for: **8 more than n** .
5. Write an expression for: **5 times p** .
6. Write an expression for: **3 less than twice x** .
7. Are $4m + 7$ and $7 + 4m$ equivalent? Explain.
8. Classify the expression **12**: variable expression or constant?

Answer Key 1

Worksheet 1: Variables, Constants & Terms — Answers

1. Variable x ; coefficient 7; constant 5
2. 3 terms
3. -6
4. $n + 8$
5. $5p$
6. $2x - 3$
7. Yes; order of addition does not change the value
8. Constant

Teacher note: Accept equivalent algebraic expressions where mathematically correct.

Worksheet 2: Writing & Translating Expressions

Show your working. Use correct algebraic notation and check your answer by substituting when useful.

1. Write an expression for **4 more than t** .
2. Write an expression for **7 less than q** .
3. Write an expression for **three times r plus 2**.
4. Write an expression for **half of x , increased by 6**.
5. Write an expression for the total cost of **n** notebooks at \$3 each plus a \$5 fee.
6. A rectangle has length l and width w . Write an expression for its perimeter.
7. A number k is multiplied by 5 and then 9 is subtracted. Write an expression.
8. Write a word description for **$6a + 10$** .

Answer Key 2

Worksheet 2: Writing & Translating Expressions — Answers

1. $t + 4$
2. $q - 7$
3. $3r + 2$
4. $x/2 + 6$
5. $3n + 5$
6. $2l + 2w$
7. $5k - 9$
8. Example: six times a plus ten

Teacher note: Accept equivalent algebraic expressions where mathematically correct.

Worksheet 3: Evaluating Expressions

Show your working. Use correct algebraic notation and check your answer by substituting when useful.

1. Evaluate $4x + 3$ when $x = 5$.
2. Evaluate $7a - 2$ when $a = 6$.
3. Evaluate $3m + 2n$ when $m = 4$ and $n = 5$.
4. Evaluate $5p - q$ when $p = 9$ and $q = 7$.
5. Evaluate $2x^2 + 1$ when $x = 3$.
6. Evaluate $12 - 3y$ when $y = 2.5$.
7. The expression $4n + 6$ represents the cost of n tickets plus a fixed fee. Find the cost when $n = 8$.
8. Find the value of $3a + 2b - 5$ when $a = 7$ and $b = 4$.

Answer Key 3

Worksheet 3: Evaluating Expressions — Answers

1. 23
2. 40
3. 22
4. 38
5. 19
6. 4.5
7. 38
8. 24

Teacher note: Accept equivalent algebraic expressions where mathematically correct.

Worksheet 4: Simplifying Like Terms

Show your working. Use correct algebraic notation and check your answer by substituting when useful.

1. Simplify: $3x + 5x$.
2. Simplify: $9a - 4a + 2$.
3. Simplify: $6p + 3 - 2p + 7$.
4. Simplify: $8m - 5 + 2m + 9$.
5. Simplify: $4x + 3y + 2x - y$.
6. Simplify: $10a - 3b - 4a + 5b$.
7. Simplify: $7q + 4 - 2q - 9$.
8. Explain why $3x + 2y$ cannot be simplified to $5xy$.

Answer Key 4

Worksheet 4: Simplifying Like Terms — Answers

1. $8x$
2. $5a + 2$
3. $4p + 10$
4. $10m + 4$
5. $6x + 2y$
6. $6a + 2b$
7. $5q - 5$
8. x and y are unlike variables, so their terms cannot be combined by addition

Teacher note: Accept equivalent algebraic expressions where mathematically correct.

Worksheet 5: Expressions in Real-Life Situations

Show your working. Use correct algebraic notation and check your answer by substituting when useful.

1. A cinema ticket costs \$8. Write an expression for n tickets.
2. A taxi charges \$4 plus \$2 per kilometre. Write an expression for k kilometres.
3. A rectangle has width 6 cm and length x cm. Write an expression for its area.
4. A school buys 5 packs of pencils at \$ p per pack and pays a \$10 delivery fee. Write an expression.
5. A phone plan costs \$25 per month plus \$0.10 for each extra minute m . Write an expression.
6. A savings account starts with \$100 and adds \$15 each week w . Write an expression for the balance.
7. A garden has x rows with 12 plants in each row, plus 8 extra plants. Write an expression and find the number when $x = 7$.
8. A club charges a \$12 membership fee plus \$5 per visit v . What is the cost for 9 visits?

Answer Key 5

Worksheet 5: Expressions in Real-Life Situations — Answers

1. $8n$
2. $4 + 2k$
3. $6x \text{ cm}^2$
4. $5p + 10$
5. $25 + 0.10m$
6. $100 + 15w$
7. $12x + 8$; when $x=7$, 92
8. \$57

Teacher note: Accept equivalent algebraic expressions where mathematically correct.

Worksheet 6: Algebraic Reasoning Challenge

Show your working. Use correct algebraic notation and check your answer by substituting when useful.

1. If $3x + 5 = 20$, find x .
2. Find x if $5x - 7 = 28$.
3. Two expressions are $4x + 9$ and $2x + 17$. For what value of x are they equal?
4. Simplify and then evaluate $3x + 5 + 2x - 4$ when $x = 6$.
5. A number n is increased by 7 and the result is doubled. Write an expression and evaluate it for $n = 8$.
6. The perimeter of a rectangle is $2l + 2w$. If $l = 9.5$ cm and $w = 4$ cm, find the perimeter.
7. Find a value of x for which $7x - 3$ is greater than $4x + 12$.
8. A pattern has n th term $4n + 1$. Find the 1st, 5th and 10th terms and describe how the pattern changes.

Answer Key 6

Worksheet 6: Algebraic Reasoning Challenge — Answers

1. $x = 5$
2. $x = 7$
3. $x = 4$
4. $5x + 1$; value 31
5. $2(n+7)$; for $n=8$, 30
6. 27 cm
7. $x > 5$; example $x=6$
8. 5, 21, 41; increases by 4 each term

Teacher note: Accept equivalent algebraic expressions where mathematically correct.